

HOW TO SELECT A GENERATOR

When selecting a power generator it is important that it is capable of meeting your energy requirements. You must match the rated output of the generator to the maximum anticipated power to be used.

DETERMINE HIGHEST DEMAND -To determine the maximum power, make a list of the tools you expect to operate, as well as the approximate power requirements in watts for each. If the wattage is not available, use the following formulas:

$$\text{WATTS} = \text{Amps} \times \text{Volts}$$

$$\text{RUNNING WATTS}^* = \text{Horsepower} \times 932^{**}$$

* Running Watts is the amount of power a motor consumes after it has started to run at normal speed.

** 932 is the factor used to convert motor horsepower to needed electrical energy. It takes into account normal losses in utilizing the power.

STARTING WATTS VS RUNNING WATTS -Most generators have an intermittent 25% overload capacity. IE: a 2,000 watt generator will carry a 2,500 watt load for a short period, such as during start up. Motors starting under a heavy load (such as air compressors, refrigeration systems and those which must bring a heavy cutting tool up to speed) will require significantly more wattage to start. This higher demand must be considered when estimating power needs. This is particularly important when more than one motor is used at one time.

EXAMPLE:

Motor	Starting Watts	Running Watts
3/4HP Air Compressor	4300	1250
7 1/4" Circular Saw	-	1500
1 1/2" Rotary Hammer	-	800
Light String (10-100 Watt Bulbs)	-	1000
		4550

In the above example, a 5,000 watt unit would be ample, but only when the air compressor was started before the other tools were started. If the other tools were in use and the air compressor started after they were on line the power requirement would jump to 7600 watts which the unit may not be cable of.

POWER OUTPUT VS ALTITUDE

Less oxygen at higher altitudes reduces engine efficiency and power output. Unless otherwise specified by the manufacturer the unit should be derated to the following values:

Alternator Rating	Peak Power	Altitudes in feet above sea level					
		2000'	3000'	4000'	5000'	6000'	7000'
1250	1375	1275	1220	1155	1100	1048	980
1750	1925	1750	1690	1615	1540	1465	1385
2500	2750	2500	2420	2300	2200	2090	1980
3650	4160	3650	3650	3500	3300	3160	2980
4000	4400	4000	3870	3700	3520	3340	3170
5000	5500	5000	4840	4620	4400	4170	3960
7500	9000	7500	7500	7500	7200	6850	6480

APPROXIMATE POWER CONSUMPTION of VARIOUS CONSTRUCTION TOOLS & APPLIANCES

Window Fan	200 Watts
Jigsaw	300
Belt Sander	1250
Screwdriver	500
Chain Saw	1250
Circular Saw (7-1/4"-8-1/4")	1500
Circular Saw (10")	2000
Cutoff Saw	2500
Portable Band Saw	750
2.5 HP Masonry Saw	2400
Impact Wrench (1/2 & 3/4")	750
Impact Wrench (1")	1250
1/4" Drill	300
3/8" Drill	475
1/2" Drill	750
1" Drill	1250
15 Amp Core Drill	1750
18 Amp Core Drill	2100
20 Amp Core Drill	2300
1/2" Hammer Drill	500
5/8" Hammer Drill	600
3/4" Hammer Drill	650
7/8" Rotary Hammer	600
1" Rotary Hammer	700
1-1/2" Rotary Hammer	800
2" Rotary Hammer	1050
1-1/8"/1-1/4" Breaker	2200
Water Pump 3000 GPH	500
Water Pump 5000 GPH	1000
Water Pump 10000 GPH	1250
Water Pump 20000 GPH	2000
Wet Dry Vacuum	1000
Water Pump (Submersible) 3000 GPH	500
Water Pump (Submersible) 5000 GPH	1000
Water Pump (Submersible) 10000 GPH	1250
Water Pump (Submersible) 20000 GPH	2000
Concrete Vibrator (3/4 HP)	1250
Concrete Vibrator (1HP)	1500
Concrete Vibrator (3HP)	2500
Air Compressor -3/4HP	1200
Air Compressor -1-1/2HP	1900
Concrete Saw - 5HP	7500

MOTOR STARTING & RUNNING WATTAGE

Motor Size	Running Watts	Universal* Motors	Induction** Motors	Capacitor Start*** Motors
		Starting Watts	Starting Watts	Starting Watts
1/4	400	500	850	1050
1/3	450	600	975	1350
1/2	600	750	1300	1800
3/4		850	1000	1900
1	1000	1250	2300	3000
1-1/2	1600	1750	3200	4200
2	2000	2350	3900	5100
3	3000		5200	6800
5	4800		7500	9800

* Utilizes a commutator and is generally used in power tools and small appliances.

** Brushless motor that has a large starting torque with less starting current. Generally used on pumps, compressors, freezers.

***An induction motor which uses capacitors to start (and in some cases run) the motor. Used on pumps, compressors and refrigeration equipment.